

REMARKS

Claims 1-97 are pending in the application. Claims 30-51 and 54-95 are withdrawn. Claims 1-29, 52, 53, 96 and 97 are rejected.

On page 2 of the Office Action, claims 17, 27 and 97 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

On page 2 of the Office Action, claims 1-8, 10, 12, 14, 24-26, 28, 52 and 53 are rejected under 35 U.S.C. 102(b) as being anticipated by Powell et al. (5,854,303).

On page 2 of the Office Action, claims 11, 17-23, 27, 29 and 96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Powell et al. as above, in view of Teumac et al. (6,465,065).

On page 3 of the Office Action, claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Powell et al. as above, in view of DeVoe et al. (4,585,559).

On page 3 of the Office Action, claims 9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Powell et al. as above, in view of Cook.

On page 4 of the Office Action, claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Powell et al. in view of Cook as above, and further in view of Schiestel et al. (6,830,494).

On page 4 of the Office Action, claim 97 is rejected under 35 U.S.C. 103(a) as being unpatentable over Powell et al. in view of Cook as above, in view of DeVoe.

With regard to claims 17, 27 and 97, which have been rejected under 35 U.S.C. 112 second paragraph, Applicants have cancelled claims 27 and 97 and have amended claim 17 to refer to the fluid container. Additionally, claim 17 is now dependent upon amended claim 1 which now provides appropriate antecedent basis for the derivatized nanoparticles. In view of the foregoing Applicant respectfully submits that the rejection under 35 U.S.C. 112 second paragraph is no longer applicable.

The Examiner has rejected claims 1-8, 10, 12, 14, 24-26, 28, 52, and 53 under 35 U.S.C. 102(b) as being anticipated by Powell et al. 5,824,303. It is respectfully submitted that claim 1 as amended is not taught or suggested by Powell et al. Independent Claim 1 as amended states that the sequestering agent is provided in a polymeric layer and comprises derivatized nanoparticles that comprise inorganic nanoparticles having an attached metal-ion sequestrant, wherein the inorganic particles have an average particle size of less than 200 nm and the derivatized particles have a stability constant greater than 10^{10} with iron (III). Additionally Claim 1 states that the metal-ion sequestering agent is provided in an immobilized polymeric layer which is permeable to water and that the metal-ion sequestering agent comprises 0.1 to 50.0% by weight of the polymeric layer.

The Examiner cites Powell for teaching providing a container having an interior surface having a metal-ion sequestering agent. As previously stated amended claim 1 set forth that the sequestering metal agent is provided in a layer on the inner surface of the container and that the layer is permeable to water. The Powell reference does not teach or suggest the providing of a layer having metal-ion sequestering agent as taught and claimed by applicants. In order to remove the undesired metal ions it is important that the fluid be able to pass in and out of the layer while allowing the metal-ion to be retained in the layer. There is no such teaching or suggestion of providing a water permeable layer as taught by Applicant. In the present invention the metal-ions must be able to pass through the layer so that it can be retained by the nanoparticles. If the sequestering agent is used as part of the composition of the container as taught by Powell, the sequestering agent would not be able to efficiently remove the metal-ion from the contained fluid. The water permeable layer of claim allows for the efficient removal of metal-ions. Further, independent Claim 1 as amended states the nanoparticles have an average particle size of less than 200 nm and that the derivatized nanoparticles have a stability constant greater than 10^{10} with iron (III). It is important that the size of the nanoparticles of the present invention so as to provide increase surface area for removing greater amounts of metal-ions. If the particles are too large it will be inefficient in sequestering the appropriate desired amount of iron from the liquid. This limitation is not taught or suggested by Powell nor does Powell et al. teach or suggested that the nanoparticles have a

stability constant greater than 10^{10} with iron (III) as claim by Applicant. The Powell et al. reference discloses the providing of a plasma discharge to provide the formation on the surface of the material. This is in complete contrast to the present invention of providing a water permeable layer having immobilized metal-ion sequestering agents therein. It is respectfully submitted that Powell does not teach or suggest the permeable layer as taught and claimed by applicant nor does it teach or suggest the various other features of the layer as claimed.

The Examiner has also rejected dependent claims 11, 17-23, 27, 29, and 96 under 35 U.S.C. 103(a) as being unpatentable over Powell in view of Teumac et al. for the reasons set forth in the Official Action. The Examiner cites Teumac as disclosing a polymeric carrier that is permeable to water, however it is respectfully submitted the Teumac reference is of little relevance to the present invention. First, the Teumac reference is directed to an oxygen scavenging composition of a carrier wherein the scavenging compound is activated for scavenging oxygen by contacting with water or water vapor which permeates through the carrier. This is total contrast with a metal-ion sequestering agent that comprises derivatized nanoparticles having an average size of less than 200 nm and a stability constant of 10^{10} with iron (III). As previously discussed, the Powell reference discloses use of a plasma discharge for providing the formation of free radicals on the surface of a material (see column 5, lines 38-41). There is no teaching or suggestion or motivation as to why one would provide a polymeric layer in Powell in view of Teumac. Quite the contrary Powell teaches away from combining Teumac with Powell as the providing of the free radical using plasma discharge is contrary to use of a carrier. Furthermore, Teumac does not teach or suggest the deficiencies of Powell. In particular neither of these references teach or suggest providing derivatized nanoparticles having an average size as set forth in claim by Applicant or that the metal-ion sequestering agent comprises 0.1 to 50.0% by weight of the polymeric layer. Therefore, applicants respectfully submit that the prior art does not teach or suggest the invention nor is there any motivation to modify either of these cited references to provide the invention as currently set forth in the Independent Claim 1.

The Examiner has also cited U.S. Patent 6,933,046 for utilization of chelating agents anchored to nanoparticles to form protective coating for surfaces. Applicant respectfully submits that the Cook reference does not teach

the invention as currently set forth by Independent Claim 1 nor would it be obvious to modify either of the Powell or Teumac references. The Cook reference is directed to providing a composition of matter and method for the preparation of surface modified aluminum hydroxide particles that releases one or more types of corrosion inhibitors when triggered by corrosion products. In particular the invention of Cook is directed to the application of a protective coating on metals and alloys such as iron, aluminum, copper and magnesium. (See col. 1, lines 22-33). This is in complete contrast to the present invention for providing a sequestering agent for inhibiting the growth of microbes in a liquid nutrient. There is no teaching or suggestion of providing a metal-ion sequestering agent in Cook. Nor is there any teaching or suggestion of providing derivatized nanoparticles that comprise inorganic nanoparticles having attached metal-ion sequestering agent having a particle size and stability or the providing a water permeable layer as taught and claimed by Applicants. The Cook reference is directed to a totally different product from the present invention and from the other cited references and is directed to solving different problems to which the present invention and other cited references. The Cook reference is directed to providing a corrosive resistant coating whereas the present invention is directed to providing a biocide. There is no teaching or suggestion of combining the Cook with either of the previous cited references. In particular, the Powell reference is directed to a polymeric material that incorporates a polyvalent cation chelating agent in an amount to inhibit the growth of an innocuous pathogen. There is no teaching or suggestion to combine a corrosive inhibitor material with the chelating agent of Powell. Nor is there any reason to combine that with an oxygen scavenging composition carrier as taught in Teumac. All three of the cited references are directed to totally different problems that are solved by different solutions. None of them teach or suggest the invention that as currently set forth in the Independent Claim 1.

The Examiner has also cited DeVoe et al. (US Patent 4,585,559) and Schiestel et al. (US Patent 6,830,694) in rejecting some the dependent claims that depend at least on Independent Claim 1. In this regard neither of these references teach anything that would render amended Independent Claim 1 obvious. Accordingly respectfully submitted that Independent Claim 1 is patentably distinct for the reasons set forth above.

Independent Claim 52 has been amended in the same manner Claim 1 has been amended and therefore is patentably distinct for the same reasons previously discussed with respect to Independent Claim 1.

In view of the foregoing Applicants respectfully submit that the claims in their present form are in condition for allowance and such action is respectfully requested.

The Commissioner is hereby authorized to charge any fees in connection with this communication to Deposit Account No. 05-0225.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read 'Frank Pincelli', written over a horizontal line.

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